

NOTE ON THE RELATION OF THE DEVONIAN AND
CARBONIFEROUS FORMATIONS WEST OF TAM-
WORTH, N.S.W.

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(Two text-figures.)

The following notes are the result of observations made by us during a cycling trip from Tamworth to Mudgee, viâ Gunnedah and Coonabarabran, with the object of examining the strata.

The geology of the Tamworth-end of the section examined, has been discussed by Professor David and Mr. E. F. Pittman*, who have shown the characteristic rocks to be interstratified radiolarian cherts and tuffs, with occasional bands of limestone. They have also shown that, as a result of tectonic movements in the district, the strata have been folded into a sharp anticline between Moonbi and Tamworth, and they have indicated the position of a probable fault, with a throw of 9,000 feet to the east.†

Our section (Fig. 2) is a continuation of that given by Professor David and Mr. E. F. Pittman, and extends to a point three miles west of Gunnedah, the section being taken along the road. It is built up from dip and strike observations made, where possible, in the road-cuttings. These are represented on the map. Unfortunately, relatively few of these were obtainable, on account of the extensive development of recent deposits. These consist chiefly of surface-alluvials, and one large bed of river-gravels, at least 60 feet thick, containing pebbles about 3 or 4 inches in diameter, which extends four miles on either side of Somerton.

* "On the Palæozoic Radiolarian Rocks of New South Wales," Q.J.G.S., Vol. lv., 1899, pp.16-37.

† *Op. cit.*, Plate 3.

The section is not detailed on account of the difficulty of obtaining outcrops, and also the short time at our disposal. It is intended to illustrate, in a general way, the lithological character and structural features of the strata.

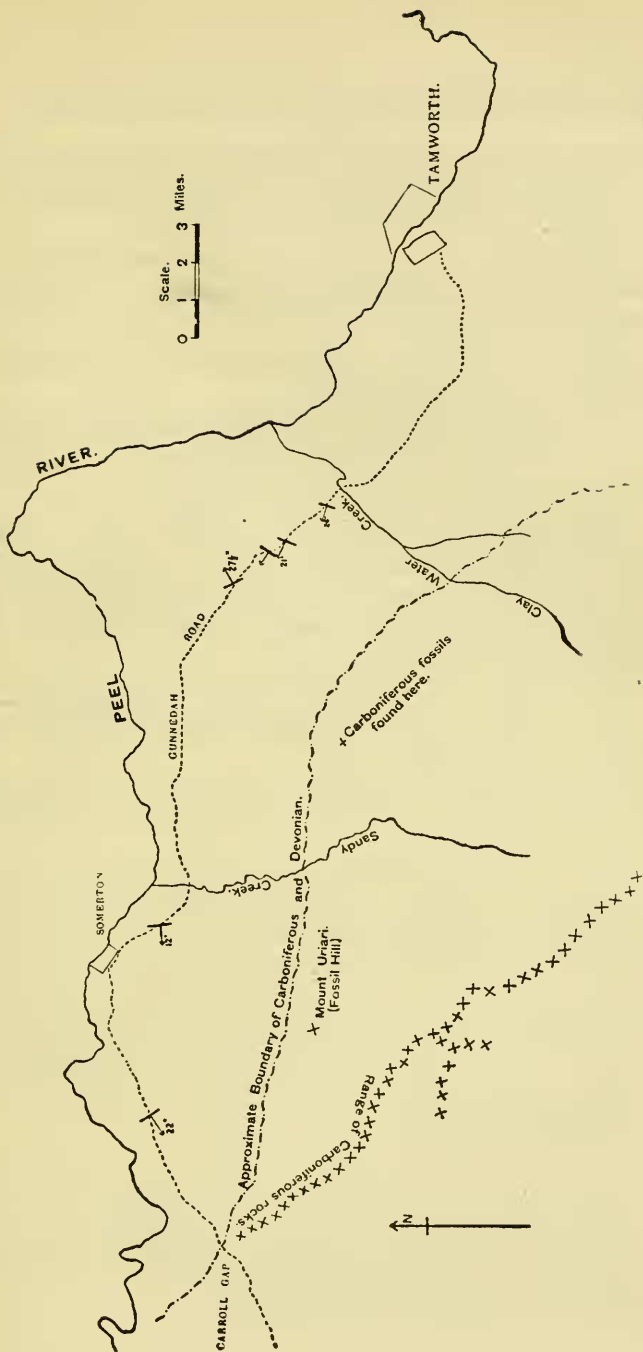
From Tamworth to within two miles of Carroll Gap (see Fig. 2), the rocks consist of interbedded tuffs and cherts, with one characteristic band of limestone. The tuffs and cherts exhibit considerable variation in their development. In some places, the tuffs appear massive, with very little chert, and in others (particularly the cutting near the 10-mile peg from Tamworth) there is very little associated tuff with the chert. Occasionally, tuffs and cherts are closely interstratified, as at a point about $8\frac{1}{2}$ miles from Tamworth, where six bands of each were observed in a thickness of about 20 feet of strata. The bed of limestone referred to, is about 10 feet thick. It is a black, fine-grained rock, characterised by the presence of small, lath-shaped crystals about 4 mm. by 0.5 mm. Examination under the microscope and treatment with HCl show that they are composed of calcite, but their distribution suggests that they are replacements of some original structure. This was observed in three distinct places, viz., 5.2, 10.7, and 21.4 miles from Tamworth.

The plotting of the dips on the map showed that we were dealing with a series of anticlines and synclines, and the strikes indicated that these were tilted. From the information obtained, we calculated that the axis of tilt is about N.3°W., and the amount of the tilt from 6-7° towards the north. Reference to the section (Fig. 2) will show how these folds harmonise with the anticline east of Tamworth.

The presence of quartz-reefs in the roading cutting 10 miles from Tamworth, observed by Messrs. Harrison and Arousseau, renders it not unlikely that the Moonbi granite-series underlies this portion of the section.

The most westerly observation of the dip of this series was at a point about two miles east of Carroll Gap. Between this point and Carroll Gap itself, outcrops are obscured by recent alluvial, and at the latter place, there is a bold outcrop of limestone dipping to the

Fig. 1.—ROUTE-MAP, TAMWORTH TO CARROLL GAP.



east at about 80°, containing Carboniferous fossils as follows:—*Zaphrentis*, *Michelinia tenuisepta*, *Spirifera*, *Euomphalus*, and *Loxonema*.

This is followed, to the west, by a conformable series of tuffs and slates, the dip being in the same direction, and decreasing in amount as we go west.

There is a well-marked physiographic break at this point, probably due to differential erosion.

The sudden discontinuity in the dip and the general appearance of the country lead us to suggest a probable fault to the east of the limestone, letting down the Carboniferous area.

The lithological resemblance of the strata between Tamworth and Carroll Gap to, and the continuity of its folding with the Devonian series of Tamworth, as well as the marked discontinuity with known Carboniferous to the west, leave little doubt but that this series is of Devonian age.

The presence of Carboniferous fossils† at the localities marked on Fig. 1, suggests that the boundary is approximately as represented on that diagram.

The Carboniferous series may be intruded by the porphyrite indicated in the section.

From this point, an alluvial flat extends to a spot about two miles west of Gunnedah, being only interrupted by a ridge of aplitic granite three miles east of that town. At the western edge of this alluvial plain, there occurs a stratified rhyolitic tuff, probably of Carboniferous age, which is overlaid by Permo-Carboniferous Coal-Measures. Further to the west and south, these Coal Measures are capped by Triassic sandstones and claystones, as at Mullaley, where specimens of *Stenopteris* were obtained from a well in the town itself.

† The following have been recorded from Mt. Uriari by Mr. W. S. Dun:—*Zaphrentis*, *Productus semireticulatus*, *P. longispinus*, *P. cf. Murchisoni*, *P. undatus*, *Orthis resupinata*, *O. australis*, *Spirifer striata*, *S. pinguis*, *Dielasma sacculum*, *Entolium aviculatum*, *Aviculopecten* sp., *Euomphalus pentangulatus*, *Dentalium*, *Orthoceras* sp. ind.

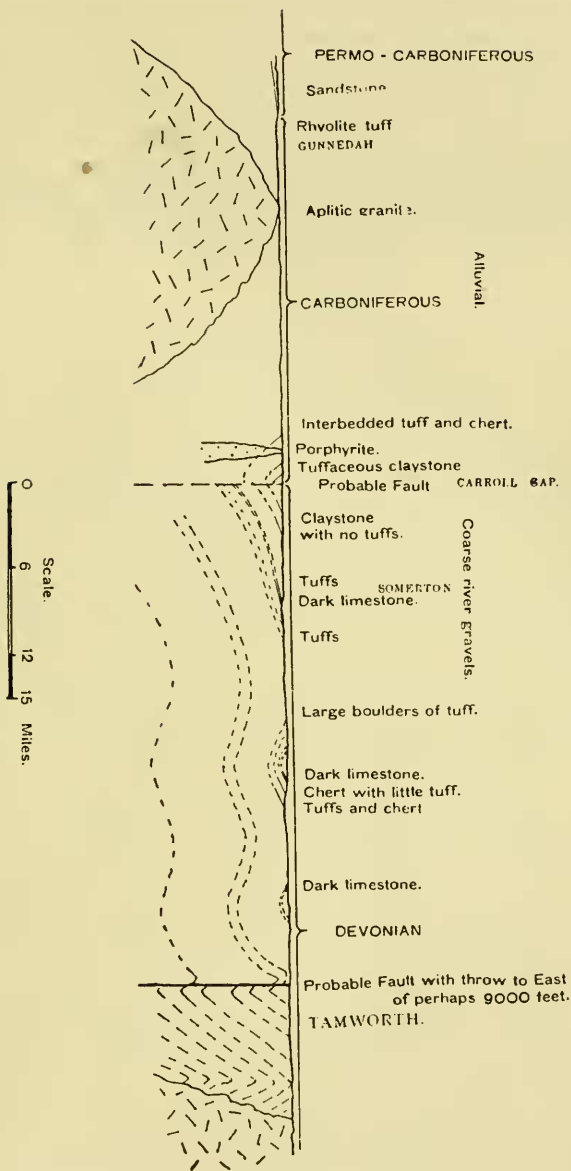


FIG. 2.—SECTION, FROM TAMWORTH TO NEAR CARROLL GAP.

Mr. R. H. Cabbage has recently found Carboniferous rocks, consisting of andesite and also cherty shales with *Rhacopteris*, just to the north-west of Currabubula. These shales strike in a north-westerly direction, and dip fairly steeply to the south-west. This point is about 25 miles S.S.E. from Carroll Gap, where Carboniferous rocks occur on the road from Tamworth to Gunnedah. This discovery shows that the whole length of the Peel Range, from Carroll Gap to Currabubula, is probably composed of Carboniferous rocks.